Comments to questions sent out prior to the December 16th State Monitoring Council meeting:

1. Briefly share your current water quality monitoring projects in North Dakota?
    - Pesticide monitoring on rivers throughout the state
    - Tile drainage water quality monitoring & water balance, lake water quality monitoring
    - H.Lo – 82 sites trace/nutrs, Ambient 8 sites + trace/nutr, Souris -4sites, 2 lake, 7times, 4tons, nutrs, TM, TOC., Chain o'Lakes, Lake Audubon (6 sites), McClusky Canal (5sites), Tschida, Patterson (2times), James River (9times)
    - During past two open water season have collected water samples for EPA/Ag Department pesticide sampling on Yellowstone River and this past year from the Missouri River just upstream of its Confluence with the Yellowstone River. Have also assisted the SHD with water sampling of NW District sport fish management waters.
    - The majority of the state parks send in water samples to ND Public Health for safe drinking water (bacteriological water analysis). The sample is tested for Coliform analysis (total Coliform and E. Coli) which is for the EPA updated Surface Water System requirements. Samples are sent upon receiving a test kit from the Health Department. Some parks also test for nitrate/nitrite annually as well. It seems that test submission varies from park to park.
    - Sheep Creek Dam, Lake Assessment begin 2011, nitrates, phosphorus, sediment; Cannonball River TMDL Implementation project, fecal coliform, nitrate; Snake Creek to Confluence with Cedar
    - Nine townships watershed coming to an end; Spring Creek Watershed starting up; cost share BMPs with 319 money; water samples and macro are complete till later years
    - ND Discovery Farms, 3 sites w/ 3 farms, surface and tile drainage
    - 5-10 NPS monitoring projects/ 2-6 river sites each, 1-2 lake sites/ ambient stream/ambient lake
    - Regulatory program to prevent contamination of surface water and potable aquifers by oil and gas operation, geothermal, waste water impoundment (municipal and industrial) etc. (also landfills)
    - 16 parameters, 3 RR, 1 WR, 2x1 month
    - Demonstration of evaluation of vegetative buffer strips to minimize runoff pollution from feedlot
    - Currently working with Greg Vandeberg on baseline and pharmaceutical sampling in the vicinity of Lake Alice NWR. Maybe working on a surface water monitoring study w/FUS person of Water Resources to track changes associated with climate change.
    - The Water Commission maintains a water resource information database consisting of about 33,861 sites within the state of ND. Of these, 32,758 sites are wells or test holes. Of these, 15,237 sites have water quality analyses as part of the record. Many of these wells are sampled on a repeated basis. About 1.500 to 2000 water samples per year are collected from wells and surface water bodies. They are analyzed for major ions and nitrate, and frequently for trace elements including iron, manganese, arsenic and boron.

In some cases other trace elements are included. Phosphorus is not measured, and constitutes a very small component of the anion composition of ground water. All water chemistry records can be obtained on the SWC database via the web. The purpose of the water chemistry monitoring program is resource characterization for purposes of defining the potential beneficial use of the water, and to complement hydrological analysis.

The SWC, in cooperation the Health Department, monitors nitrate concentrations in the Karlsruhe aquifer as a part of an ongoing analysis and assessment of the nitrate loading, where the SWC serves as the investigators for the Health Department regulatory actions. These are related to a project monitored under the Environmental and Rangeland fund, and are questionable for dissemination with spatial data because of possible legal limitations.

The SWC, under contract with the North Dakota National Guard, has designed a monitoring well network to assess impact of training activities on ground water at Camp Grafton South, and performs a comprehensive sampling every five years, including general chemistry, selected trace elements, munitions and explosives residues, selected pesticides, and petroleum residues. The data is provided in tabular form to the National Guard with a report. General chemistry, trace elements, and nitrate data are in the database. Organic chem. Data are in reports.

The SWC has provided sampling and analysis of nitrate contamination in the Englevale aquifer. The data are in the database.

The SWC has cooperated with university entities, including the Carrington Station, the UND geology department, the EERC, the Extension, and various other departments. Much of the data is in our database. Organic chem. Data are in reports.

2. What are your water quality monitoring needs?
    - None at the moment.
    - Cations/anions, nutrients, heavy metals, pesticides
    - Most monitoring needs associated with identifying sources of water quality impairments, so that needed corrective/remedial actions can be determined and then implemented.
    - The following:
        - More active role in monitoring surface water
        - Hands-on training surface water monitoring
        - Monitoring equipment
        - Herbicide testing-monthly
        - Priority pollutants tested monthly
        - Knowledge of where to access to regional-county assessment data/watershed monitoring results

    - Bacteria monitoring – surface waters
    - Biological monitoring – benthic macroinvertebreates
    - Funding opportunities and sources for state agencies
- Training and equipment for lake sampling
    - Boats etc
- We are finished sampling for 2010. Will sample Spring Creek in later years after BMPs installed
- Writer to develop fact sheets and website materials
- More people
- Access to data?
- Financial, analysis
- Nutrient runoff
- Immediate needs would be up-to-date baseline monitoring of the Yellowstone and Missouri Rivers in the Confluence area and similar testing on the Lake Alice area. Movement towards including emerging contaminants and ocribe dispruptors and the like, would be nice
- The main program is our ambient sampling program. We are currently meeting our sampling needs.

3. Are there gaps in existing water quality data? Please specify where.
    - In my area, pesticides, the is very little data on pesticide concentrations in wetlands and lakes
    - In frequency
    - Yes, there are gaps in documenting existing water quality conditions in a number of the state's lakes and rivers. The SHD has an inventory of which lakes have and have not been sampled, but data is generally limited for even most of the waters which been sampled.
    - Trend analysis data; baseline conditions prior to riparian restoration efforts
    - Data from samples on an annual basis for reports. Not sure if we have current access.
    - Snowmelt runoff
    - Linkage between ambient & smaller projects. USGS – etc.
    - Storm water
    - No data available
    - Water quality data in Missouri River, Williston reach? Confluence? Yellowstone from state line to Confluence?
    - We know of no gaps related to our mission. If there were, we'd fill them with current resources.
4. Name one thing you would like to include in your project if money/time was not an object?
    - Sediment sampling for pesticides
    - Continuous monitoring for major problematic contaminants
    - More temporal data

- To sample and analyze water samples more specifically to the possible or suspected site of impairment. For example to expand water sampling sites on the Yellowstone River to include return flow drain effluent to actually sample/document the types and concentrations of pesticides in irrigation return flow water.
- Priority pollutants testing monthly including pesticides/herbicides
- Engineering for simple ag waste management designs
- Manure composing (tractor and composter), manure spreader (triple beater), repair riparian areas, more training
- Full time person at each of the farms to work the gauging stations during spring melt
- Statistician
- Storm water, DNA analysis
- To examine the effectiveness of different buffer species and buffer length to minimize nutrient runoff
- High flow event sampling at our hotspots, for full suite of metals/ions/ ECs
- We know of no additional sampling needs at this time.

5. What would like this monitoring council to do for you?
    - Information sharing
    - Share data
    - Work to coordinate and implement standardized and more thorough water quality monitoring, so that ND might then move on to be far more effective in protecting and restoring the State's water resources.
    - Identify potential funding sources available to state agencies; share data and knowledge-access; coordination of statewide water quality efforts
    - Keep me informed; serve as a peer group to discuss issues and learn from, ie data interpretation
    - Improve consistency in everything but primarily analytes
    - Provide funding to do additional demonstration and research on buffers and other nutrient runoff mitigation methods.
    - I'd like it to function as a venue for project coordination so we can maximize our effectiveness by not duplicating efforts; I'd also like to see a central database come out of this.
    - The SWC has no requests of the monitoring council.
6. Is there a need for a central database of monitoring projects?
    - Yes! If not a database, maybe some central website with brief overviews of projects with contact info to get the data directly from the project manager. I know EPA has set up a WQX, but from my understanding it is too complicated/time consuming for most groups.
    - Yes
    - Maybe not an urgent need, but certainly seems to be an important as well as fairly easy thing to develop and then to update as needed.
    - Yes. A Central database is needed for electron data storage and comprehensive analysis.

- Exist on EPA web site; training to access correct data for project area; benchmark data to compare to updated data to determine progress
- Yes, maybe a website
- In Denver? @ USGS? Where? Metafile (lat/long) – time –date-sampler-agency; tri-state council (MT, ID, WYO)
- Yes
- Yes!
- Some centralized information – a clearinghouse or data warehouse of sorts may be of value. But a central database would likely be problematic for several reasons.
    a. Large databases from different sources are cumbersome time consuming to maintain, and often lead to misinterpretation of the data. "One-size fits all" centralized functions are abstracted from the original context and mission in which the data was obtained. It is a "secondary" repository, and therefore usually less authoritative than the primary source.
    b. Data out of context is easily misused and misinterpreted. For example, research entities like universities usually collect data within a research plan, with other complementary data for which the designers are most competent to interpret. Just throwing the data out for others can easily lead to misuse and misinterpretation. Similarly, the SWC data is provided within consistent sampling protocols and quality control assurances, and in conjunction with detailed well data, water level data, well construction data, lithologies etc. **We believe that water quality data is best accessed directly from its primary custodian on a site that CONTAINS all of the complementary data to assist in its interpretation. The SWC data IS easily available to all.** Moving it elsewhere would serve no useful purpose that we conceive of.
    c. The process of collecting and processing data, and storing it for access with adequate quality control is time consuming. An additional task of transfer on an annual basis would be time and labor intensive. **If an open source external protocol were to be developed for accessing multiple databases, the SWC would likely be willing to meet that protocol, if the time, resources and cost involved were within reason.**
    d. There may be a value for a data repository for voluntary archiving of data with appropriate metadata for "dead" projects – ie. Completed projects where the data is simply sitting in paper or computer files with no further known or likely use. However, data should not be moved or archived from "active" databases to secondary databases, because this perpetuates errors. To use the SWC database example, our hydrologists are constantly revisiting their data as it is used, and error corrections are ongoing. Ex. Sometimes there might be a misplace decimal that comes to light. The changes in survey coordinates from NAD 27,29 to NAD 83,88 is another example. Survey discrepancies have only recently been normalized in the database. Data archived before that would have unrectified

errors. **Updating and improvement is ongoing – and clients should always have access to the latest and best when it is available from a primary source. Again, data should be accessed, whenever possible, from its primary custodian.**

e. **There are many situational legal problems with data transfers.** Examples are the Industrial Commission, much of which is proprietary and unavailable for public dissemination. Another important example is data collected by the Health Department using the Environmental and Rangeland Fund, for which any data published with geographical references would be a felony. This is our state's main ground-water monitoring program for nutrients and pesticide, but the Attorney General has determined that to divulge the information in any way that can be tied to a landowner is a felony. Best be careful if ERF funding is used for surface water too.

f. **Water quality data, and the methods by which it is collected, are best determined by the mission for which it is collected.** Adding unnecessary cost for missions external to an agency's mission would be inappropriate. For example: the SWC mission is EXTENSIVE – it is a reconnaissance program. Taking a fraction of the arsenic samples to meet clean-clean procedures for other purposes would not be acceptable and would be deleterious to the SWC's mission. If court-worthy arsenic data is needed, the wells need to be revisited with clean-clean methods by appropriate parties. This is far more cost effective. **Trying to meet all missions in all samples is wasteful.**

g. A helpful approach would be to inventory all water quality sources, and present a web-based description of the data source (web database, publications, other data repositories), and provide referral to those sources – direct web references, personal contacts, pdf reports or journal references, and so on.)

Summary

1. The SWC would be willing to appoint a staff participant and advisory member to the state Water Quality Advisory Council and to interact with the Council.
2. The SWC provides open access to all of its water chemistry and well data within an organized and easily accessible format available to the public on the web. All agencies and the public are welcome to use it. Staff hydrologists and data managers are available for first-hand discussion of any difficulties or interpretations.
3. The SWC staff would have no interest in transferring the data, en masse to a secondary custody abstracted from the parties that collect the data and their ongoing corrections. This would only serve to perpetuate errors and misinterpretations.
4. The SWC staff would see a potential purpose for some form of centralized information such as: (1) A central index of what data exists

and where and how to access it, with data descriptions and web links might be useful; (2) an archive of “dead” project data in accessible form (project data with no other public repositories) may be useful to preserve data from loss; and (30 an open-source data access routine for all agencies and sources may be useful, if not excessively expensive and time consuming to accommodate. But the data should remain within primary custody as a source.

5. The SWC has developed its sampling protocols in relation to its mission and needs over a period of more than a half century. Modification with additional expense to meet the “perceived” needs of outside projects, or to meet the requirements of a “self-perceived” exterior “authority” would not be appropriate.

   Communication is good. Sharing of data is good. Top-on-down, “one-size-fits-all” mandates are not good.